

09/07/2011

1214829 - R8 SDMS



RE: Third West air monitor results

Shepherd, Michael to: Joyce Ackerman

Cc: "Clegg, Benjamin M.", "Craig Barnitz (cbarnitz@utah.gov)"

09/07/2011 11:29 AM

From: "Shepherd, Michael" <Michael.Shepherd@PacifiCorp.com>
To: Joyce Ackerman/R8/USEPA/US@EPA
Cc: "Clegg, Benjamin M." <Benjamin.Clegg@PacifiCorp.com>, "Craig Barnitz (cbarnitz@utah.gov)" <cbarnitz@utah.gov>

1 attachment



219459-1,2.pdf

Joyce,

It was Chrysotile. The data sheet is page 4 of the attached report.

Thanks,

Mike Shepherd
801.220.4584 Office
801.631.1310 Cell

-----Original Message-----

From: Ackerman.Joyce@epamail.epa.gov [mailto:Ackerman.Joyce@epamail.epa.gov]
Sent: Wednesday, September 07, 2011 10:25 AM
To: Shepherd, Michael
Cc: Clegg, Benjamin M.; Craig Barnitz (cbarnitz@utah.gov)
Subject: Re: Third West air monitor results

Hi Mike - I noticed on page 2 of this report that there were some fibers detected, although too few to be registered above the lab's reporting limit. I didn't see the data sheet for these samples. Is it available to see what kind of fibers were seen by the lab (e.g., chrysotile, tremolite, etc.)?

Thanks!

Joyce Ackerman, On-Scene Coordinator
EPA Region 8
1595 Wynkoop St.
Denver, CO 80202
Phone: 303-312-6822

From: "Shepherd, Michael" <Michael.Shepherd@PacifiCorp.com>
To: "Craig Barnitz (cbarnitz@utah.gov)" <cbarnitz@utah.gov>, Joyce Ackerman/R8/USEPA/US@EPA
Cc: "Clegg, Benjamin M." <Benjamin.Clegg@PacifiCorp.com>
Date: 09/02/2011 09:19 AM
Subject: Third West air monitor results

Craig and Joyce,

Attached are the air monitoring results for the past week. All results came back negative.

Thanks,

Mike Shepherd

Project Manager

Rocky Mountain Power - Major Projects

801.220.4584 Office

801.631.1310 Cell

801.220.2797 Fax

michael.shepherd@pacificorp.com[attachment "219459-1.pdf" deleted by

Joyce Ackerman/R8/USEPA/US]



September 7, 2011

Laboratory Code: RES
Subcontract Number: NA
Laboratory Report: RES 219459-1,2
Project # / P.O. #: None Given
Project Description: 3rd West Substation

David Roskelley
R & R Environmental
47 West 9000 South #2
Sandy UT 84070

Dear Customer,

Reservoirs Environmental, Inc. is an analytical laboratory accredited for the analysis of Industrial Hygiene and Environmental matrices by the National Voluntary Laboratory Accreditation Program (NVLAP), Lab Code 101896-0 for Transmission Electron Microscopy (TEM) and Polarized Light Microscopy (PLM) analysis and the American Industrial Hygiene Association (AIHA), Lab ID 101533 - Accreditation Certificate #480 for Phase Contrast Microscopy (PCM) analysis. This laboratory is currently proficient in both Proficiency Testing and PAT programs respectively.

Reservoirs Environmental, Inc. has analyzed the following samples for asbestos content as per your request. The analysis has been completed in general accordance with the appropriate methodology as stated in the attached analysis table. The results have been submitted to your office.

RES 219459-1,2 is the job number assigned to this study. This report is considered highly confidential and the sole property of the customer. Reservoirs Environmental, Inc. will not discuss any part of this study with personnel other than those of the client. The results described in this report only apply to the samples analyzed. This report must not be used to claim endorsement of products or analytical results by NVLAP or any agency of the U.S. Government. This report shall not be reproduced except in full, without written approval from Reservoirs Environmental, Inc. Samples will be disposed of after sixty days unless longer storage is requested. If you have any questions about this report, please feel free to call 303-964-1986.

Sincerely,

A handwritten signature in black ink, appearing to read "Jeanne Orr", is written over a horizontal line.

Jeanne Spencer Orr
President

RESERVOIRS ENVIRONMENTAL, INC.

AIHA Certificate of Accreditation #480, Lab ID 101533

TABLE : PCM NIOSH 7400 FIBER COUNT ANALYSIS

RES Job Number: RES 219459-1,2
 Client: R & R Environmental
 Client Project Number / P.O.: None Given
 Client Project Description: 3rd West Substation
 Date Samples Received: August 25, 2011
 Analysis Type: PCM 7400 A, Issue 2
 Turnaround: 3-5 Day
 Date Samples Analyzed: August 30, 2011

Client ID Number	Lab ID Number	Air Volume Sampled (L)	Fields Analyzed	Fiber Count	Reporting Limit (F/mm ²)	Fiber Density (F/mm ²)	Reporting Limit (F/cc)	Fiber Concentration (F/cc)
3W-081911-N	EM 786508	1156	100	1	7.01	BRL	0.002	BRL
3W-081911-E	EM 786509	1152	100	2.5	7.01	BRL	0.002	BRL
3W-081911-S	EM 786510	758	100	0	7.01	BRL	0.004	BRL
3W-081911-W	EM 786511	496	100	1	7.01	BRL	0.005	BRL

* Unless otherwise stated sample analyses have been blank corrected.

Laboratory Quarterly Coefficient Variation (CV) by Fiber Count Range - April 1, 2011 - June 30, 2011

5-20 CV = 0.26

>20-50 CV = 0.20

>50-100 = 0.14

CBR = Cannot Be Read
 BRL = Below Reporting Limit

Digitally
 signed by
 Gina
 Veltrano
 Date:
 2011.09.07
 08:30:22
 -0500

Data QA

RESERVOIRS ENVIRONMENTAL, INC.

NVLAP Lab Code 101896-0; TDH: #30-0015

TABLE I. TEM AIR FILTER SAMPLE DATA AND ANALYTICAL RESULTS

RES Job Number: RES 219459-1,2
 Client: R & R Environmental
 Client Project Number / P.O.: None Given
 Client Project Description: 3rd West Substation
 Date Samples Received: August 25, 2011
 Analysis Type: TEM, AHERA
 Turnaround: 3-5 Day
 Date Samples Analyzed: August 31, 2011 & September 6, 2011

Client ID Number	Lab ID Number	Area Analyzed (mm ²)	Air Volume Sampled (L)	Number of Asbestos Structures Detected	Analytical Sensitivity (s/cc)	Asbestos Concentration (s/cc)	Filter Loading (s/mm ²)
3W-081911-N	EM 786508	0.0770	1156	1	0.0043	0.0043	13.0
3W-081911-E	EM 786509	0.0770	1152	ND	0.0043	BAS	BAS
3W-081911-S	EM 786510	0.1100	758	ND	0.0046	BAS	BAS
3W-081911-W	EM 786511	0.1100	496	ND	0.0071	BAS	BAS
3W-082211-N	EM 786512	0.0990	872	ND	0.0045	BAS	BAS
3W-082211-E	EM 786513	0.1100	874	ND	0.0040	BAS	BAS
3W-082211-S	EM 786514	0.0990	876	ND	0.0044	BAS	BAS
3W-082211-W	EM 786515	0.0990	874	ND	0.0044	BAS	BAS
3W-082311-E	EM 786516	0.0880	888	ND	0.0049	BAS	BAS
3W-082311-S	EM 786517	0.0880	884	ND	0.0049	BAS	BAS
3W-082311-W	EM 786518	0.0880	884	ND	0.0049	BAS	BAS
3W-082311-N	EM 786519	0.0880	880	ND	0.0050	BAS	BAS
3W-082411-S	EM 786520	0.0880	916	ND	0.0048	BAS	BAS
3W-082411-E	EM 786521	0.0880	916	ND	0.0048	BAS	BAS
3W-082411-N	EM 786522	0.0880	892	ND	0.0049	BAS	BAS
3W-082411-W	EM 786523	0.0880	908	ND	0.0048	BAS	BAS

NA = Not Analyzed
 ND = None Detected
 BAS = Below Analytical Sensitivity
 Average Grid Opening in mm² = 0.011

Filter Material = Mixed Cellulose Ester
 Filter Diameter = 25 mm
 Effective Filter Area = 385 sq mm

gvi
 Digitally signed
 by Gine
 Vetrano
 Date
 2011.09.07
 08:30:27 -0600

DATA QA

RESERVOIRS ENVIRONMENTAL, INC.

NVLAP Lab Code 101896-0; TDH: #30-0015

TABLE II. SUMMARY OF ANALYTICAL DATA

RES Job Number: RES 219459-1,2
 Client: R & R Environmental
 Client Project Number / P.O.: None Given
 Client Project Description: 3rd West Substation
 Date Samples Received: August 25, 2011
 Analysis Type: TEM, AHERA
 Turnaround: 3-5 Day
 Date Samples Analyzed: August 31, 2011 & September

Client ID Number	Lab ID Number	Asbestos Mineral	Asbestos Structure Types*				Structures >5 Microns in Length	**Excluded Structures	Asbestos Structures for Concentration
			Fibers	Bundles	Clusters	Matrices			
3W-081911-N	EM 786508	Chrysotile	0	0	0	1	0	0	1
3W-081911-E	EM 786509	ND	0	0	0	0	0	0	0
3W-081911-S	EM 786510	ND	0	0	0	0	0	0	0
3W-081911-W	EM 786511	ND	0	0	0	0	0	0	0
3W-082211-N	EM 786512	ND	0	0	0	0	0	0	0
3W-082211-E	EM 786513	ND	0	0	0	0	0	0	0
3W-082211-S	EM 786514	ND	0	0	0	0	0	0	0
3W-082211-W	EM 786515	ND	0	0	0	0	0	0	0
3W-082311-E	EM 786516	ND	0	0	0	0	0	0	0
3W-082311-S	EM 786517	ND	0	0	0	0	0	0	0
3W-082311-W	EM 786518	ND	0	0	0	0	0	0	0
3W-082311-N	EM 786519	ND	0	0	0	0	0	0	0
3W-082411-S	EM 786520	ND	0	0	0	0	0	0	0
3W-082411-E	EM 786521	ND	0	0	0	0	0	0	0
3W-082411-N	EM 786522	ND	0	0	0	0	0	0	0
3W-082411-W	EM 786523	ND	0	0	0	0	0	0	0

*See Analytical Procedure for definitions

**C = Excluded from total due to lack of confirmation

**L = Excluded from total for length less than 0.5 micron (AHERA only)

**A = Excluded from total due to incorrect aspect ratio

ND = None Detected

Due Date: 8-30-91
Due Time: 8:5a

RES 219459



Reservoirs Environmental, Inc.

5801 Logan St. Denver, CO 80216 • Ph: 303 864-1868 • Fax 303-477-4276 • Toll Free: 888-REI-ENV

Pager: 303-809-2468

Page 1 of 2

INVOICE TO: (IF DIFFERENT)

CONTACT INFORMATION:

Company: <u>R&R Environmental</u>	Company:	Contact: <u>Dave Roskelley</u>	Contact: <u>Justin Kargis</u>
Address: <u>4714 9000 S</u>	Address:	Phone: <u>801 541-1035</u>	Phone: <u>801 828-5219</u>
<u>Sandy Ut. 8400</u>		Fax:	Fax:
		Cell/pager:	Cell/pager:
Project Number (under P.O. #):		Fiscal Officer/Accounting Email Address:	
Project Description/Location: <u>3RD West Substation</u>		<u>dave@renviro.com, justin@renviro.com</u>	

ASBESTOS LABORATORY HOURS: Weekdays: 7am - 7pm		REQUESTED ANALYSIS										VAUD MATRIX CODES		LAB NOTES:							
PLM / PCM / TEM	<u>STANDARD</u>	PLM - Short report, Long report, Point Count	TEM - AHERA, Level II, 7402, ISO, +/-, Quant, Semi-quant, Micro-vac, ISO-Indirect Preps	PCM - 7400A, 7400B, OSHA	DUST - Total, Respirable	METALS - Analyte(s)	RCRA 8, TCLP, Welding Fume, Metals Scan	ORGANICS - METH	Salmonella: +/-	E.coli O157:H7: +/-	Listeria: +/-	Aerobic Plate Count: +/- or Quantification	E.coli: +/- or Quantification	Coliforms: +/- or Quantification	S.aureus: +/- or Quantification	Y & M: +/- or Quantification	Molds: +/-, Identification, Quantification	Al = A	Bulk = B		
	<u>RUSH (Same Day)</u>																	DUST = D	Paint = P		
	<u>PRIORITY (Next Day)</u>																	Soil = S	Wipe = W		
	<u>(Rush PCM = 2hr, TEM = 6hr.)</u>																	Swab = SW	F = Food		
																		Drinking Water = DW	Waste Water = WW		
CHEMISTRY LABORATORY HOURS: Weekdays: 8am - 8pm																					
Metal(s) / Dmt	<u>RUSH 24 hr. 3-5 Day</u>																				
RCRA 8 / Metals & WMDing	<u>RUSH 5 day 10 day</u>																				
Fume Scan / TCLP																					
Organics	<u>24 hr. 3 day 5 Day</u>																				
MICROBIOLOGY LABORATORY HOURS: Weekdays: 9am - 6pm																					
E.coli O157:H7, Coliforms, S.aureus	<u>24 hr. 2 Day 3-5 Day</u>																				
Salmonella, Listeria, E.coli, APC, Y A M	<u>48 Hr. 3-5 Day</u>																				
MoM	<u>RUSH 24 Hr 48 Hr 3 Day 5 Day</u>																				
Turnaround times establish a laboratory priority, subject to laboratory volume and are not guaranteed. Additional Fees apply for afterhours, weekends and holidays.																					
Special Instructions:																					
Client sample ID number (Sample ID's must be unique)																					
1	3W-081911-N			X														1.156	8/19/11		786508
2	3W-081911-E			X														1.152			9
3	3W-081911-S			X														758			10
4	3W-081911-W			X														496			11
5	3W-082211-N		X															872	8/22/11		12
6	3W-082211-E		X															874			13
7	3W-082211-S		X															876			14
8	3W-082211-W		X															874			15
9	3W-082311-E		X															888	8/23/11		16
10	3W-082311-S		X															884	8/23/11		17

Number of samples received: 16 (Additional samples shall be listed on attached long form.)

NOTE: REI will analyze incoming samples based upon information received and will not be responsible for errors or omissions in calculations resulting from the inaccuracy of original data. By signing client/company representative agrees that submission of the following samples for requested analysis as indicated on this Chain of Custody shall constitute an analytical services agreement with payment terms of NET 30 days, failure to comply with payment terms may result in a 1.5% monthly interest surcharge.

Relinquished By: <u>Justin Kargis</u>	Fed-Ex	Date/Time: <u>8/24/11</u>	Sample Condition: On Ice Sealed Intact
Laboratory Use Only			Temp. (F°) Yes / No Yes / No Ym / No
Received By: <u>Justin Kargis</u>	Date/Time: <u>8/25/11</u>	Carrier: <u>Fed-Ex</u>	
Results:	Contact Phone Email Fax Date Time Initials	Contact Phone Email Fax Date Time Initials	
	Contact Phone Email Fax Date Time Initials	Contact Phone Email Fax Date Time Initials	

Justin Kargis 787-4398 7340

Due Date: 8-28-91
Due Time: 8:50a

REILAB Reservoirs Environmental, Inc.
5801 Logan St Denver, CO 80216 • Ph: 303 964-1988 • Fax 303-477-4275 • Toll Free 866 REI-ENV
Pager: 303-509-2098

Job # 219459
Page # 2 of 2

INVOICE TO: (IF DIFFERENT)

CONTACT INFORMATION:

Company: <u>R.R.</u>	Company:	Contact:	Contact:
Address:	Address:	Phone:	Phone:
		Fax:	Fax:
		Cell/pager:	Cell/pager:
Project Number and/or P.O. #		Final Data Deliverable Email Address:	
Project Description/Location: <u>3rd West Substation continued</u>			

ASBESTOS LABORATORY HOURS: Weekdays: 7am - 7pm		REQUESTED ANALYSIS												VALID MATRIX CODES		LAB NOTES:						
PLM / PCM / TEM <u> </u> RUSH (Same Day) <u> </u> PRIORITY (Next Day) <u> </u> STANDARD (Rush PCM = 2hr, TEM = 6hr.)		PLM - Short report, Long report, Point Count	TEM - AHERA, Level II, 7402, ISO, +/-, Quant, Semi-quant, Micro-veg, ISO-Indirect Procs	PCM - 7400A, 7400B, OSHA	DUST - Total, Respirable	METALS - Analytical	ROTA 8, TCLP, Welding Fume, Metals Scan	ORGANICS - METH	Salmonella: +/-	E.coli O157:H7: +/-	Listeria: +/-	Aerobic Plate Count: +/- or Quantification	E.coli +/- or Quantification	Coliforms: +/- or Quantification	S aureus: +/- or Quantification	Y & M: +/- or Quantification	Mold: +/-, Identification, Quantification	SAMPLER'S INITIALS OR OTHER NOTES	Air = A	Bulk = B		
																			Dust = D	Paint = P		
																			Soil = S	Wipe = W		
																			Swab = SW	F = Food		
																			Drinking Water = DW	Waste Water = WW		
CHEMISTRY LABORATORY HOURS: Weekdays: 8am - 5pm														O = Other								
Metal(s) / Dust <u> </u> RUSH <u> </u> 24 hr. <u> </u> 3-5 Day														**ASTM E1792 approved wipe media only**								
RCRA 8 / Metals & Welding Fume Scan / TCLP <u> </u> RUSH <u> </u> 5 day <u> </u> 10 day														Sample Volume (L) / Area	Matrix Code	# Containers	Date Collected mm/dd/yy	Time Collected hh:mm a/p	EM Number (Laboratory Use Only)			
Organics <u> </u> 24 hr. <u> </u> 3 day <u> </u> 5 Day																						
MICROBIOLOGY LABORATORY HOURS: Weekdays: 8am - 6pm																						
E.coli O157:H7, Coliforms, S.aureus <u> </u> 24 hr. <u> </u> 2 Day <u> </u> 3-5 Day																						
Salmonella, Usteria, E.coli, APC, Y & M <u> </u> 48 Hr. <u> </u> 3-5 Day																						
Mold <u> </u> RUSH <u> </u> 24 Hr <u> </u> 48 Hr <u> </u> 3 Day <u> </u> 5 Day																						
Turnaround times establish a laboratory priority, subject to laboratory volume and are not guaranteed. Additional fees apply for afterhours, weekends and holidays.																						
Special Instructions:																						
Client sample ID number (Sample ID's must be unique)																						
1	3W-082311-W																	884	A			786518
2	3W-082311-N																	880				17
3	3W-082411-S																	916				20
4	3W-082411-E																	916				21
5	3W-082411-N																	892				22
6	3W-082411-W																	908				23
7																						
8																						
9																						
10																						

Number of samples received: _____ (Additional samples shall be listed on attached long form.)
NOTE: REI will analyze incoming samples based upon information received and will not be responsible for errors or omissions in calculations resulting from the inaccuracy of original data. By signing client/company representative agrees that submission of the following samples for requested analysis as indicated on this Chain of Custody shall constitute an analytical services agreement with payment terms of NET 30 days, failure to comply with payment terms may result in a 1.5% monthly interest surcharge.

Relinquished By: <u>[Signature]</u> Date/Time: <u>8/25/91 8:45a</u>						Sample Condition: On Ice Sealed Intact Temp. (F°) <u> </u> Yes / No Yes / No <u>Yes / No</u>			
Laboratory Use Only Received By: <u>[Signature]</u> Date/Time: <u>8/25/91 8:45a</u> Carrier: <u>FedEx</u>									
Results:	Contact	Phone	Email	Fax	Date	Contact	Phone	Email	Fax
	Contact	Phone	Email	Fax	Date	Contact	Phone	Email	Fax

Attachment I

Key to Count Sheets Count Sheets Analytical Procedures

Structures identifications consist of an Asbestos Type followed by a Structure Type

Asbestos Type

A = Amosite
An = Anthophyllite
C = Chrysotile
Cr = Crocidolite
T = Tremolite

Structure Types

F = Fiber
B = Bundle
C = Cluster
M = Matrix

ND = no structures detected
M = other structure associated with a matrix
NAM = Non Asbestos Mineral
XGB = partly obscured by a grid bar

Sizing Conversion

1 length unit = 5 mm on screen = 0.278 micron

1.80 length units = 0.5 micron

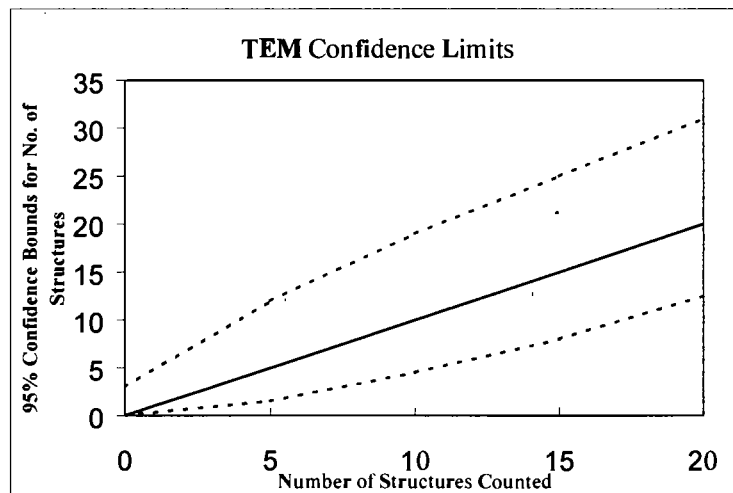
18.0 length units = 5 microns

1 width unit = 1 mm on screen = 0.0556 micron

TEM Analysts

Jeanne S. Orr
Nathan DelHierro
Angela Heitger
Jonathan Bernard

Paul D. LoScalzo
Mark Steiner
Norberto Zimbleman
Robert Workman



Upper and lower 95% confidence bounds for the number of structures counted assuming a Poisson distribution.

Reservoirs Environmental, Inc.
TEM Asbestos Structure Count

Laboratory name:	REI
Instrument	JEOL 100 N/S
Voltage (KV)	100 KV
Magnification	20KX 10KX
Grid opening area (mm ²)	0.011
Scale: 1L =	0.28 um
Scale: 1D =	0.058 um
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	
QA Type	

Client:	R + R
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm ²)	1156
Date received by lab	8/25/11
Lab Job Number:	219459
Lab Sample Number:	786508

Analyzed by	JK
Analysis date	9/6/11
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
Counting rules (ISO, AHEHA, ASTM)	A1+
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

F-Factor Calculation (Indirect Preps Only):

Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class			Sketch/Comments	1 = yes, blank = no		
			Primary	Total	Length	Width		Amphibole	C	NAM		Sketch	Photo	EDS
A	F4-1	ND												
	E4-1	ND												
	C4-1	ND												
	B4-1	ND												
B	G6-1	M		1	2	1	CDX		/		See			
	F6-1	ND												
	E6-1	ND												

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Rev 3-2009

Reservoirs Environmental, Inc.
TEM Asbestos Structure Count

Laboratory name:	REI
Instrument	JEOL 100 N S
Voltage (KV)	100 KV
Magnification	20KX 10KX
Grid opening area (mm ²)	0.011
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	
QA Type	

Client :	R + R
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm ²)	1152
Date received by lab	8/25/11
Lab Job Number:	219459
Lab Sample Number:	786509

F-Factor Calculation (Indirect Preps Only):

Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Analyzed by	TK
Analysis date	9/6/11
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	AH
Grkl storage location	Month Analyzed
Scope Alignment	Date Analyzed

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class			Sketch/Comments	1 = yes, blank = no		
			Primary	Total	Length	Width		Amphibole	C	NAM		Sketch	Photo	EDS
A	G4-3	ND												
	F4-3	ND												
	E4-3	ND												
	C4-3	ND					Prep A ~80% intact			5-10% debris				
B	E4-4	ND												
	C4-4	ND												
	B4-4	ND					Prep B ~A			few fibers still in				

Rev 3-2009

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Reservoirs Environmental, inc.
TEM Asbestos Structure Count

Laboratory name:	REI
Instrument	JEOL 100 N (S)
Voltage (KV)	100 KV
Magnification	(20KX) 10KX
Grid opening area (mm ²)	0.011
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	
QA Type	

Client:	R + R
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm ²)	758
Date received by lab	8/25/11
Lab Job Number:	219459
Lab Sample Number	786510

Analyzed by	AK AH
Analysis date	9/6/11
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	AH
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

F-Factor Calculation (Indirect Preps Only):

Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class			Sketch/Comments	1 = yes, blank = no		
			Primary	Total	Length	WMth		Amphibole	C	NAM		Sketch	Photo	EDS
A	E3-1	ND												
	C3-4	ND												
	C3-1	ND												
	B3-4	ND												
	B3-1	ND												
B	C3-4	ND												
	E3-4	ND												
	E3-1	ND												
	C3-1	ND												
	B3-4	ND												

Rev 3-2008

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Reservoirs Environmental, Inc.
TEM Asbestos Structure Count

Laboratory name:	REI
Instrument	JEOL 100 <u>N</u> S
Voltage (KV)	100 KV
Magnification	<u>20KX</u> 10KX
Grid opening area (mm ²)	0.011
Scale: 1L =	0.28 μ m
Scale: 1D =	0.056 μ m
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	
QA Type	

Client:	R + R
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm ²)	496
Date received by lab	8/25/11
Lab Job Number:	219459
Lab Sample Number:	786511

F-Factor Calculation (Indirect Preps Only):

Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Analyzed by	TK
Analysis date	9/6/11
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	A11
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class			Sketch/Comments	1 = yes, blank = no		
			Primary	Total	Length	Width		Amphibole	C	NAM		Sketch	Photo	EDS
A	H4-3	ND												
	G4-3	ND												
	F4-3	ND												
	E5-6	ND												
	C5-6	ND					Prep A ~70%	intact		5-7% Debris				
B	E5-4	ND												
	C5-4	ND												
	B5-4	ND												
	E6-4	ND												
	C6-4	ND					Prep B ~A			few fine 9/6/11				

Rev 3-2008

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Reservoirs Environmental, Inc.
TEM Asbestos Structure Count

Laboratory name:	REI
Instrument	JEOL 100 N (S)
Voltage (KV)	100 KV
Magnification	200X 10KX
Grid opening area (mm ²)	0.011
Scale: 1L =	0.28 μ m
Scale: 1D =	0.056 μ m
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	
QA Type	

Client:	R+R
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm ²)	872
Date received by lab	8-26-11
Lab Job Number:	219459
Lab Sample Number:	786512

Analyzed by	Att
Analysis date	8-30-11
Method (D=Direct, I=Indirect, IA=indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	Alora
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

F-Factor Calculation (Indirect Preps Only):

Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class			Sketch/Comments	1 = yes, blank = no		
			Primary	Total	Length	Width		Amphibole	C	NAM		Sketch	Photo	EDS
A	F3-6	ND												
	F3-3	ND												
	E3-6	ND			Prep A: 75% intact 3-5% debris									
	E3-3	ND			Prep B: 95% intact 3-5% debris									
	C3-6	ND												
B	F3-4	ND												
	F3-1	ND												
	E3-4	ND												
	E3-1	ND												

Rev 3-2009

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Reservoirs Environmental, Inc.
TEM Asbestos Structure Count

Laboratory name:	REI
Instrument	JEOL 100 N(S)
Voltage (KV)	100 KV
Magnification	20KX 10KX
Grid opening area (mm ²)	0.011
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	
QA Type	

Client :	R & R
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm ²)	874
Date received by lab	8-26-11
Lab Job Number:	219459
Lab Sample Number:	78653

F-Factor Calculation (Indirect Preps Only):

Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Analyzed by	Att
Analysis date	8-30-11
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	Alora
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class			Sketch/Comments	1 = yes, blank = no		
			Primary	Total	Length	Width		Amphibole	C	NAM		Sketch	Photo	EDS
A	F3-4	ND												
	F3-1	ND												
	E3-4	ND												
	E3-1	ND												
	E2-3	ND												
B	G3-4	ND												
	G3-1	ND												
	F3-4	ND												
	F3-1	ND												
	E3-4	ND												

Rev 3-2009

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Reservoirs Environmental, Inc.
TEM Asbestos Structure Count

Laboratory name:	REI
Instrument	JEOL 100/S
Voltage (KV)	100 KV
Magnification	20KX 10KX
Grid opening area (mm ²)	0.011
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	
QA Type	

Client:	R+R
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm ²)	874
Date received by lab	8-26-11
Lab Job Number:	219459
Lab Sample Number:	786514

Analyzed by	MD
Analysis date	8/31/11
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	Ahera
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

F-Factor Calculation (Indirect Preps Only):

Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class			Sketch/Comments	1 = yes, blank = no		
			Primary	Total	Length	Width		Amphibole	C	NAM		Sketch	Photo	EDS
A	HS-4	MD												
	GS-4	MD												
	FS-4	MD												
	ES-4	MD												
	CS-4	MD												
B	HA-4	MD												
	GA-4	MD												
	FA-4	MD												
	EA-4	MD												

Rev 3-2009

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Reservoirs Environmental, Inc.
TEM Asbestos Structure Count

Laboratory name:	REI
Instrument	JEOL 100 ^N S
Voltage (KV)	100 KV
Magnification	20KX 10KX
Grid opening area (mm ²)	0.011
Scale: 1L =	0.28 um
Scale: 1D =	0.058 um
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	
QA Type	

Client:	R&R
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm ²)	874
Date received by lab	8-26-11
Lab Job Number:	219459
Lab Sample Number:	786515

Analyzed by	ND
Analysis date	8/31/11
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	Ahera
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

F-Factor Calculation (Indirect Preps Only):

Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class			Sketch/Comments	1 = yes, blank = no		
			Primary	Total	Length	Width		Amphibole	C	NAM		Sketch	Photo	EDS
A	H3-3	ND												
	G3-3	ND												
	F3-3	ND												
	E3-3	ND												
	C3-3	ND												
	B3-3	ND												
B	H6-4	ND												
	G6-4	ND												
	F6-4	ND												

50-30 x. Tract S. Johns

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Reservoirs Environmental, Inc.
TEM Asbestos Structure Count

Laboratory name:	REI
Instrument	JEOL 100 <u>N</u> S
Voltage (KV)	100 KV
Magnification	<u>20KX</u> 10KX
Grid opening area (mm ²)	0.011
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	
QA Type	

Client :	R & R
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm ²)	888
Date received by lab	8-26-11
Lab Job Number:	219459
Lab Sample Number:	786510

Analyzed by	JB
Analysis date	8/31/11
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	Ahera
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

F-Factor Calculation (Indirect Preps Only):

Fraction of primary filter used	
Total Ruspenskin Volume (ml)	
Volume Applied to secondary filter (ml)	

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class			Sketch/Comments	1 = yes, blank = no		
			Primary	Total	Length	Width		Amphibole	C	NAM		Sketch	Photo	EDS
A	E4-4	ND												
	E4-1	ND					Pmp A 60% ambient				3-5% debris			
	C4-4	ND					Pmp B 60% ambient				3-5% debris			
	C5-1	ND												
JB	F4-4	ND												
	E4-4	ND												
	C4-4	ND												
	C3-4	ND												

Rev 3-2009

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Reservoirs Environmental, Inc.
TEM Asbestos Structure Count

Laboratory name:	REI
Instrument	JEOL 100(N) S
Voltage (KV)	100 KV
Magnification	20KX 10KX
Grid opening area (mm ²)	0.011
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	
QA Type	

Client:	R&R
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm ²)	884
Date received by lab	8-26-11
Lab Job Number:	219459
Lab Sample Number:	786517

Analyzed by	JTB
Analysis date	8/31/11
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	Ahera
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

F-Factor Calculation (Indirect Preps Only):

Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class			Sketch/Comments	1 = yes, blank = no		
			Primary	Total	Length	Width		Amphibole	C	NAM		Sketch	Photo	EDS
A	L5-1	ND												
	H5-1	ND												
	H5-1	ND												
	G5-1	ND												
	F5-1	ND												
B	G5-1	ND												
	F5-1	ND												
	E5-1	ND												

Prep A 80% ambient 5-7% debris
 Prep B 80% ambient 5-7% debris
 JTB 8/31/11

Rev 3-2009

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Reservoirs Environmental, Inc.
TEM Asbestos Structure Count

Laboratory name:	REI
Instrument	JEOL 100(N)S
Voltage (KV)	100 KV
Magnification	20KX 10KX
Grid opening area (mm ²)	0.011
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	
QA Type	

Client :	R&R
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm ²)	884
Date received by lab	8-26-11
Lab Job Number:	219459
Lab Sample Number:	78658

F-Factor Calculation (Indirect Preps Only):

Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Analyzed by	JB
Analysis date	8/31/11
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	Ahera
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class			Sketch/Comments	1 = yes, blank = no		
			Primary	Total	Length	Width		Amphibole	C	NAM		Sketch	Photo	EDS
A	K4-3	ND												
	H4-3	ND					Pmp A	90% in hmt			5-7% debris			
	G4-3	ND					Pmp B	90% in hmt			5-7% debris			
	F4-3	ND												
B	G4-6	ND												
	F4-6	ND												
	E4-6	ND												
	C4-3	ND												

Rev 3-2009

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Reservoirs Environmental, Inc.
TEM Asbestos Structure Count

Laboratory name:	REI
Instrument	JEOL 100/N/S
Voltage (KV)	100 KV
Magnification	20KX 10KX
Grid opening area (mm ²)	0.011
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	
QA Type	

Client :	R&R
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm ²)	880
Date received by lab	8-26-11
Lab Job Number:	219459
Lab Sample Number:	78659

Analyzed by	JTB
Analysis date	8/31/11
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	ID
Counting miles (ISO, AHEFA, ASTM)	Ahera
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

F-Factor Calculation (Indirect Preps Only):

Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class			Sketch/Comments	1 = yes, blank = no		
			Primary	Total	Length	Width		Amphibole	C	NAM		Sketch	Photo	EDS
A	H4-1	ND												
	G4-1	ND												
	F4-1	ND												
	E4-1	ND												
B	L4-1	ND												
	K4-1	ND												
	H4-1	ND												
	G4-1	ND												

Rev 3-2009

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Reservoirs Environmental, Inc.
TEM Asbestos Structure Count

Laboratory name:	REI
Instrument	JEOL 100 <u>N</u> S
Voltage (KV)	100 KV
Magnification	<u>20KX</u> 10KX
Grid opening area (mm ²)	0.011
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	
QA Type	

Client :	R&R
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm ²)	916
Date received by lab	8-26-11
Lab Job Number:	219459
Lab Sample Number:	786520

Analyzed by	JB
Analysis date	8/31/11
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	Ahera
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

F-Factor Calculation (Indirect Preps Only):

Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class			Sketch/Comments	1 = yes, blank = no		
			Primary	Total	Length	Width		Amphibole	C	NAM		Sketch	Photo	EDS
A	K3-6	ND												
	H3-6	ND												
	G3-6	ND												
	F3-6	ND												
B	K4-4	ND												
	H4-4	ND												
	G4-4	ND												
	F4-4	ND												

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Reservoirs Environmental, Inc.
TEM Asbestos Structure Count

Laboratory name:	REI
Instrument	JEOL 100(N)S
Voltage (KV)	100 KV
Magnification	20KX 10KX
Grid opening area (mm ²)	0.011
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	
QA Type	

Client:	R&R
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm ²)	916
Date received by lab	8-26-11
Lab Job Number:	219459
Lab Sample Number:	786521

Analyzed by	JTB
Analysis date	8/31/11
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
Counting miles (ISO, AHERA, ASTM)	Ahera
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

F-Factor Calculation (Indirect Preps Only):

Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class			Sketch/Comments	1 = yes, blank = no		
			Primary	Total	Length	Width		Amphibole	C	NAM		Sketch	Photo	EDS
A	K5-1	ND												
	H5-1	ND												
	G5-1	ND												
	F5-1	ND												
B	K6-1	ND												
	H6-1	ND												
	G6-1	ND												
	F6-1	ND												

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Reservoir Environmental, Inc.
TEM Asbestos Structure Count

Laboratory name:	REI
Instrument	JEOL 100 N S
Voltage (KV)	100 KV
Magnification	20KX 10KX
Grid opening area (mm ²)	0.011
Scale: 1L =	0.28 um
Scale: 1D =	0.058 um
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	
QA Type	

Client:	R&R
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm ²)	892
Date received by lab	8-26-11
Lab Job Number:	219459
Lab Sample Number:	786522

Analyzed by	JB
Analysis date	8/31/11
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	Ahera
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

F-Factor Calculation (Indirect Preps Only):

Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class			Sketch/Comments	1 = yes, blank = no		
			Primary	Total	Length	Width		Amphibole	C	NAM		Sketch	Photo	EDS
A	G5-4	ND					Prep A 90% in front Prep B ~ A JB 8/31/11							
	F5-4	ND												
	E5-4	ND												
	G5-4	ND												
B	H4-4	ND												
	G4-4	ND												
	F4-4	ND												
	E4-4	ND												

Rev 3-2009

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Reservoirs Environmental, Inc.
TEM Asbestos Structure Count

Laboratory name:	REI
Instrument	JEOL 100(N S)
Voltage (KV)	100 KV
Magnification	20KX 10KX
Grid opening area (mm ²)	0.011
Scale: 1L =	0.28 um
Scale: 1D =	0.056 um
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	
QA Type	

Client:	R&R
Sample Type (A=Air, D=Dust):	A
Air volume (L) or dust area (cm ²)	908
Date received by lab	8-26-11
Lab Job Number:	219459
Lab Sample Number	786523

Analyzed by	JTB
Analysis date	8/31/11
Method (D=Direct, I=Indirect, IA=Indirect, ashed)	D
Counting rules (ISO, AHERA, ASTM)	Ahera
Grid storage location	Month Analyzed
Scope Alignment	Date Analyzed

F-Factor Calculation (Indirect Preps Only):

Fraction of primary filter used	
Total Resuspension Volume (ml)	
Volume Applied to secondary filter (ml)	

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class			Sketch/Comments	1 = yes, blank = no		
			Primary	Total	Length	Width		Amphibole	C	NAM		Sketch	Photo	EDS
A	H4-4	ND												
	G4-4	ND					Prep A 90% intact				3-5% debris			
	F4-4	ND												
	E4-4	ND					Prep B 80% intact				3-5% debris			
B	H4-3	ND												
	G4-3	ND												
	F4-3	ND												
	E4-3	ND												

Rev 3-2009

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

C = Chrysotile

NAM = Non-asbestos material

Analytical Procedures – AHERA

Transmission electron microscopy/energy dispersive X-ray spectrometry/selected area electron diffraction (TEM/EDX/SAED) was employed in the analysis of the samples, which were collected on 25 mm mixed cellulose ester air filters. A portion of each filter was collapsed with acetone and etched in a plasma asher. The etched filter was then coated with a thin layer of carbon in a carbon side down. The sample was then placed inside a condensation washer and treated with acetone to remove the filter matrix and expose any inert material.

For each sample, enough grid openings on a 200 mesh TEM grid are analyzed to ensure an analytical sensitivity of at least 0.005 structures/cc. A minimum of four grid openings from two preparations are analyzed for each sample. The grid openings are searched for fibrous structures which, if present are analyzed by SAED and/or EDX (elemental analysis). The AHERA protocol requires SAED confirmation of enough chrysotile asbestos structures on each sample to cause the sample to exceed 70 structures/mm² (usually 4 or 5 structures). Both SAED and EDX confirmation are required of enough amphibole structures on each sample to cause the sample to exceed 70 structures/mm² (usually 4 or 5 structures) per sample. Either SAED or EDX is required for the remaining asbestos structures of either type. The morphology of each structure is determined and the length and the diameter of any asbestos structures are recorded. Asbestos fibers, bundles, cluster and matrices were identified and recorded. The asbestos structures have been defined in AHERA as follows:

Fiber:	is a structure having a minimum length greater than or equal to 0.5 micron with an aspect ratio of 5:1 or greater with substantially parallel sides.
Bundle:	is a structure composed of three or more fibers in parallel arrangement, with each fiber closer than the diameter of one fiber.
Cluster:	is a structure with fibers in random arrangements such that all fibers are intermixed and no single fiber is isolated from the group.
Matrix:	is a fiber or fibers with one end free and the other end embedded or hidden by a particulate. The exposed fiber end must meet the fiber definition given above.

If more than 50 asbestos structures are identified and confirmed on a sample, AHERA analysis may be terminated after completion of the grid opening, which contains the 50th structure. AHERA protocol requires the laboratory to reject any clearance sample which contains in excess of 25% total particulate loading or which appears to be unevenly loaded.

The AHERA protocol includes specific sampling requirements, including minimum numbers of samples and minimum air volumes. Specifically, the 70 structures/mm² clearance criteria is only allowed for sets five inside samples (collected in a group of 13 samples including: five outsides and three blanks) with volumes greater than 1200 liters (40 CFR Part 763, page 41894). Deviation from the AHERA sampling protocol may affect the validity of the analytical results. Analysis of samples collected by non-protocol methods are not accredited by NVLAP

Equations Used for Calculations

$$\text{Area Analyzed, mm}^2 = \# \text{ GO counted} \times \text{Average GO Area (mm)}$$

$$\text{Concentration, s/cc} = \frac{\# \text{ Asbestos Structures}}{\# \text{ GO Counted}} \times \frac{1}{\text{Volume (L)}} \times \frac{\text{Eff. Filter Area (mm}^2\text{)}}{\text{Average GO area (mm}^2\text{)}} \times \frac{1\text{L}}{1000\text{cc}}$$

$$\text{Filter loading, s/mm}^2 = \frac{\# \text{ Asbestos structures}}{\text{Area Analyzed (mm}^2\text{)}}$$

GO = TEM grid opening